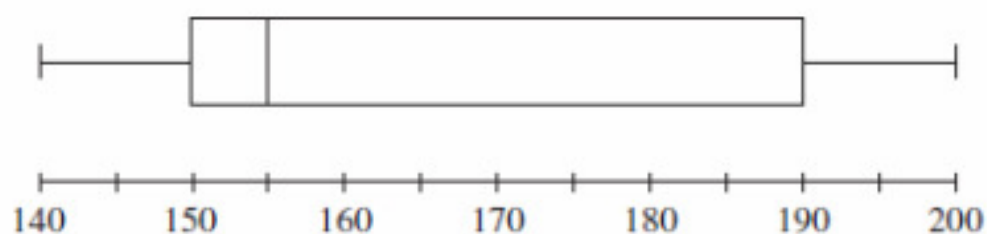


# DATA Past hsc questions...

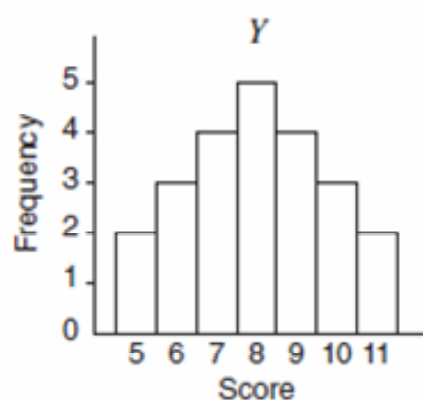
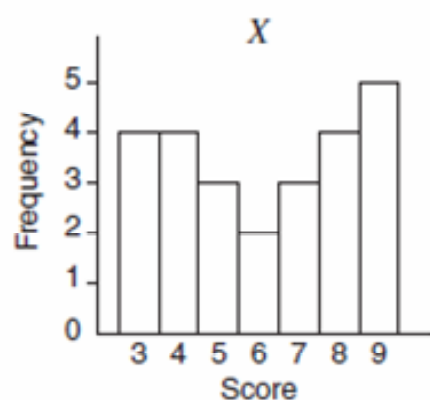
2011

- 7 A set of data is displayed in this box-and-whisker plot.



Which of the following best describes this set of data?

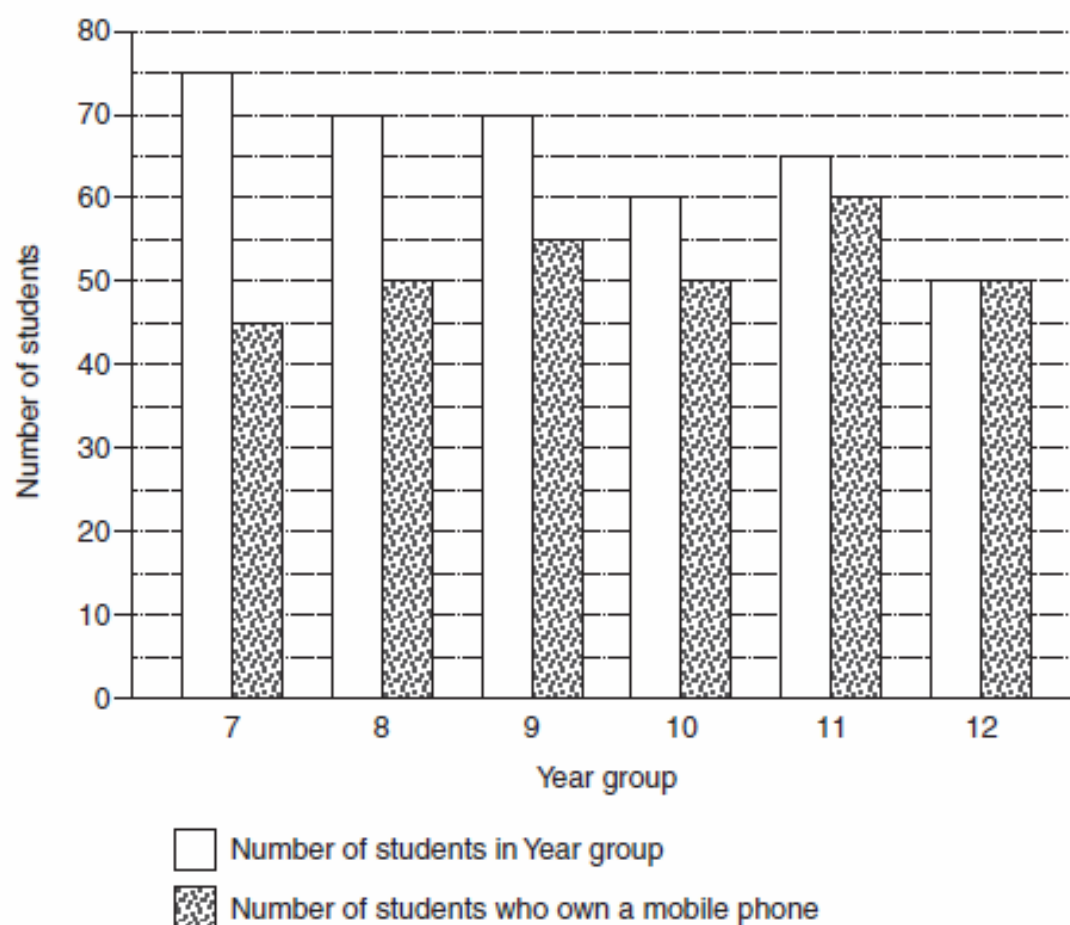
- (A) Symmetrical
  - (B) Positively skewed
  - ☒ (C) Negatively skewed
  - (D) Normally distributed
- 11 The sets of data,  $X$  and  $Y$ , are displayed in the histograms.



Which of these statements is true?

- (A)  $X$  has a larger mode and  $Y$  has a larger range.
- ☒ (B)  $X$  has a larger mode and the ranges are the same.
- (C) The modes are the same and  $Y$  has a larger range.
- (D) The modes are the same and the ranges are the same.

- (b) The graph below displays data collected at a school on the number of students in each Year group, who own a mobile phone.



- (i) Which Year group has the highest percentage of students with mobile phones? **1**  
Yr 12

- (ii) Two students are chosen at random, one from Year 9 and one from Year 10. Which student is more likely to own a mobile phone? Justify your answer with suitable calculations. **2**

Yr 9 =  $\frac{55}{125} = 0.44$  Yr 10 =  $\frac{50}{110} = 0.45$  Yr 10 has a slightly no. of students with mobs, so Yr 10

- (iii) Identify a trend in the data shown in the graph. **1**

The ownership of mobile phones increases as Yr group rises.

- 17 The heights of the players in a basketball team were recorded as 1.8 m, 1.83 m, 1.84 m, 1.86 m and 1.92 m. When a sixth player joined the team, the average height of the players increased by 1 centimetre.

What was the height of the sixth player?

$$\bar{x} \text{ of original} = \frac{1.8 + 1.83 + 1.84 + 1.86 + 1.92}{5} = 1.85$$

(A) 1.85 m

(B) 1.86 m

(C) 1.91 m

(D) 1.93 m

$$\text{new } \bar{x} = 1.86$$

$$1.86 = \frac{1.8 + 1.83 + 1.84 + 1.86 + 1.92 + y}{6}$$

$$11.16 = 9.25 + y$$

$$1.91 = y$$

- (d) Data was collected from 30 students on the number of text messages they had sent in the previous 24 hours. The set of data collected is displayed.

| Male |   |   |   |   |   |   |   |   |   |   | Female |   |   |   |   |   |   |   |  |  |
|------|---|---|---|---|---|---|---|---|---|---|--------|---|---|---|---|---|---|---|--|--|
| 9    | 9 | 8 | 7 | 6 | 5 | 5 | 4 | 2 | 1 | 0 | 8      | 9 |   |   |   |   |   |   |  |  |
|      |   |   |   |   |   | 1 | 1 | 0 | 0 | 1 | 1      | 1 | 2 | 5 | 6 | 8 | 8 | 8 |  |  |
|      |   |   |   |   |   |   |   |   | 0 | 2 | 0      | 1 | 7 |   |   |   |   |   |  |  |
|      |   |   |   |   |   |   |   |   |   | 3 | 4      |   |   |   |   |   |   |   |  |  |
|      |   |   |   |   |   |   |   |   |   | 4 |        |   |   |   |   |   |   |   |  |  |
|      |   |   |   |   |   |   |   |   |   | 5 |        |   |   |   |   |   |   |   |  |  |
|      |   |   |   |   |   |   |   |   |   | 6 |        |   |   |   |   |   |   |   |  |  |
|      |   |   |   |   |   |   |   |   | 1 | 7 |        |   |   |   |   |   |   |   |  |  |

- (i) What is the outlier for this set of data? 71 1
- (ii) What is the interquartile range of the data collected from the female students? 1

$$Q1 = 11 \quad Q3 = 20.5$$

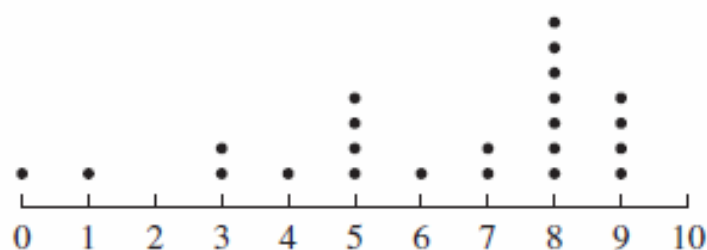
$$IQR = 20.5 - 11$$

$$= 9.5$$

2010

- 1 The results of a survey are displayed in the dot plot.

What is the range of this data?



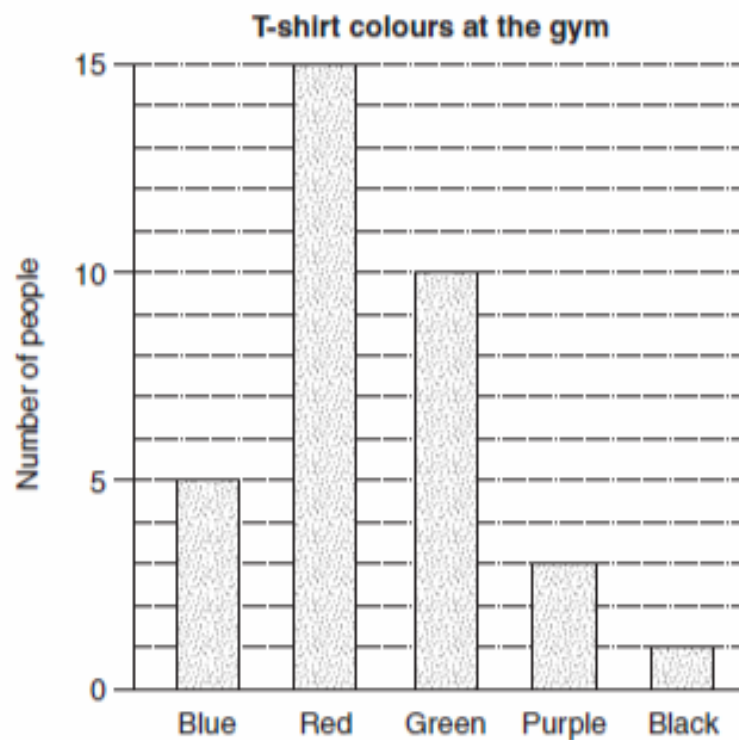
- (A) 7
- (B) 8
- (C) 9
- (D) 10

- 16 This back-to-back stem-and-leaf plot displays the test results for a class of 26 students.

| Boys |   |   |   |   | Girls |   |   |   |   |
|------|---|---|---|---|-------|---|---|---|---|
|      |   |   | 1 | 2 | 1     | 2 | 4 |   |   |
|      |   |   | 3 | 3 | 0     | 2 | 3 | 5 |   |
| 9    | 7 | 4 | 4 | 4 | 4     | 4 | 5 | 9 | 9 |
| 6    | 4 | 2 | 2 | 5 | 3     |   |   |   |   |
|      |   | 3 | 0 | 6 | 1     | 9 |   |   |   |

What is the median test result for the class?

- (A) 44  
 (B) 46  
 (C) 48  
 (D) 49
- (c) On Saturday, Jonty recorded the colour of T-shirts worn by the people at his gym. The results are shown in the graph.

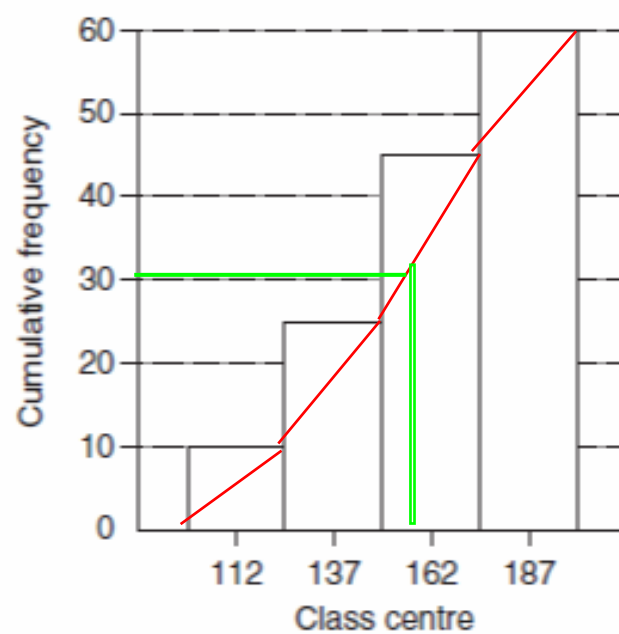


- (i) How many people were at the gym on Saturday? (Assume everyone was wearing a T-shirt.) 34 1
- (ii) What is the probability that a person selected at random at the gym on Saturday, would be wearing either a blue or green T-shirt? 1
- $P(B \text{ or } G) = \frac{15}{34}$

- (b) A new shopping centre has opened near a primary school. A survey is conducted to determine the number of motor vehicles that pass the school each afternoon between 2.30 pm and 4.00 pm.

The results for 60 days have been recorded in the table and are displayed in the cumulative frequency histogram.

| Score   | Class centre | Frequency | Cumulative frequency |
|---------|--------------|-----------|----------------------|
| 100–124 | 112          | 10        | 10                   |
| 125–149 | 137          | X         | 25                   |
| 150–174 | 162          | 20        | 45                   |
| 175–199 | 187          | 15        | 60                   |



- (i) Find the value of X in the table. 15 1
- (ii) Carefully copy the cumulative frequency histogram into your writing booklet. 1
- On the cumulative frequency histogram you have copied draw a cumulative frequency polygon (ogive) for this data.
- (iii) Use your graph to determine the median. Show, by drawing lines on your graph, how you arrived at your answer. 158 1
- (iv) Prior to the opening of the new shopping centre, the median number of motor vehicles passing the school between 2.30 pm and 4.00 pm was 57 vehicles per day. 2

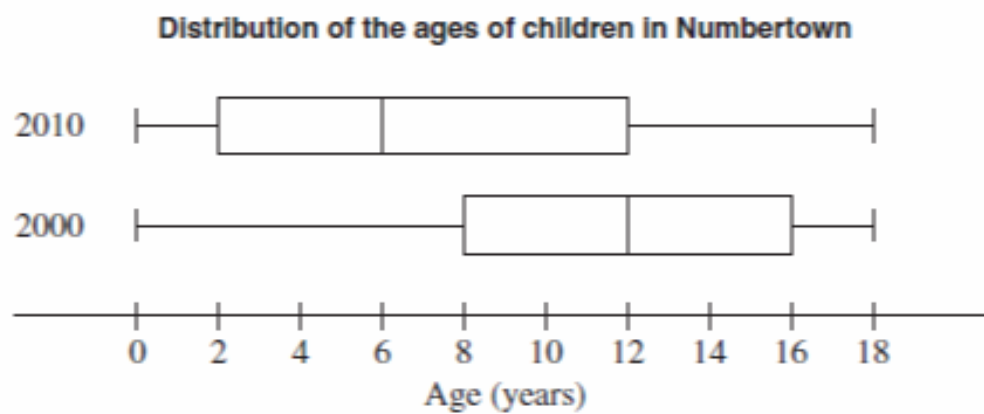
What problem could arise from the change in the median number of motor vehicles passing the school before and after the opening of the new shopping centre?

Briefly recommend a solution to this problem.

More vehicles passing the school could contribute to difficulties with dropping off or picking up students. One solution could be to introduce traffic lights to slow down traffic



- (b) The graphs show the distribution of the ages of children in Numbertown in 2000 and 2010.



- (i) In 2000 there were 1750 children aged 0–18 years. 1  
 How many children were aged 12–18 years in 2000?  $50\% \text{ of } 1750 = 875$
- (ii) The number of children aged 12–18 years is the same in both 2000 and 2010. 1  
 How many children aged 0–18 years are there in 2010?  $25\% = 875$   
 $100\% = 3500$
- (iii) Identify TWO changes in the distribution of ages between 2000 and 2010. In your answer, refer to measures of location or spread or the shape of the distributions. 2  
 Median decreased from 12 to 6  
 IQR has increased from 8–10; distribution for 2000 is neg skewed but for 2010 it is positively skewed.
- (iv) What would be ONE possible implication for government planning, as a consequence of this change in the distribution of ages? 1  
 Implications: Schools  
 Preschools  
 Health centres  
 Day care centres  
 Sporting facilities